Where the TLTWO is used, the TCP shall include the above provisions for the separation of opposing traffic except:

A. Transition Zones - Positive Barrier (Pre-cast Construction Barrier Curb or approved alternate).

B. Between Transitions - Positive Barrier, as described in A above or by delineation devices, such as drums, cones or vertical panels, as deemed appropriate by the Design Unit and with the concurrence of the Bureau of Traffic Signal and Safety Engineering.

C. Striping and complimentary signing shall be used in conjunction with A and B above.

Distance from the Traveled Way: An obstruction within the clear zone may warrant a construction barrier. The clear zone is the area, starting at the edge of the traveled way, available for safe use by errant vehicles. See Section 8.2.3, "Clear Zone", on directions on how to determine if an obstruction is within the clear zone.

Duration of Existence: A construction barrier may be warranted if an obstruction will remain within the clear zone for more than one work shift.

14.8.3 Applications

Construction Barrier Curb, is shown on Construction Detail Sheets CD-159-3, CD-159-4 and CD-159-5. Alternate A can be pinned to the roadway, and Alternate B has pockets to receive 1 inch diameter anchor bolts as well as pin holes.

There are four attachment types. Attachment Type A should only be used at those locations where an maximum allowable movement of the barrier, when hit, of 39 inches is acceptable. When the maximum allowable movement is 33 inches, attachment Type B should be used. When the maximum allowable movement is 12 inches, attachment Type C should be used. When the maximum allowable movement is zero inches, attachment Type D should be used. The attachment type to be used at specific locations should be indicated on the Traffic Control and Staging Plans.

Attachment Type B uses a box beam bolted onto the construction side of the barrier to help reduce deflections. Refer to Construction Detail sheet CD-159-3.1. The box beam side cannot be placed adjacent to traffic due to the potential snag hazard. Construction Barrier Curb stiffened with box beams shall be installed at least 50 feet prior to, be continuous through, and extend at least 50 feet beyond the area requiring limited deflection. Show limits on Traffic Control Plans.

The following chart summarizes the respective attachment types:

Attachment Type	Use	Connections
A	Maximum allowable deflection of 39 inches	Connection Key and barrier end sections fully pinned*
B	Maximum allowable deflection of 33 inches (Cannot be used with traffic on both sides of the barrier.)	Connection Key, 6” by 6” box beam, non-shrink grout every joint, and barrier end sections fully pinned*
C	Maximum allowable deflection of 12 inches	Connection Key, non-shrink grout every joint, traffic side of all sections pinned, and barrier end sections fully pinned*
D	Maximum allowable deflection of zero inches	Connection Key, non-shrink grout every joint, and bolt every anchor pocket hole in every unit

* Fully Pinned: pins in every anchor recess on both sides. End Sections: The first and last barrier piece of the entire run regardless of connection type.

Pinning barriers to a new bridge deck is undesirable. Pinning barrier to a bridge deck that has an existing LMC overlay undermines the effectiveness of the LMC. In addition, the extra costs associated with placement of LMC make it especially undesirable to lessen its effectiveness by drilling holes through it. Designers are advised to investigate alternatives in order to eliminate the need for pinned barrier on bridge decks where possible so as not to compromise the benefits of the LMC overlay. As an example, if sufficient additional lateral room can be gained, this will eliminate the need for a pinned Construction Barrier Curb.

Construction Barrier Curb shall not be installed on side slopes steeper than 10H:1V. The approach end shall either be flared at 8:1 beyond the clear distance or, when terminated within the clear zone, the approach end of the barrier shall be shielded. See Section 9 for design of inertial barriers or temporary compressive crash cushions.

The minimum functional length of Construction Barrier is 100 feet. Construction Barrier Curb comes in units of 20 feet length, however, other lengths may be used to meet field conditions, see nominal lengths in the Standard Construction Details. The approach length of need (L.O.N.) is the minimum length of construction barrier required in front of the warranting obstruction to shield the hazard effectively. See Figure 14-A for instructions on how to determine the L.O.N. of a Construction Barrier Curb.

FIGURE 14–A:
LENGTH OF NEED OF CONSTRUCTION BARRIER CURB

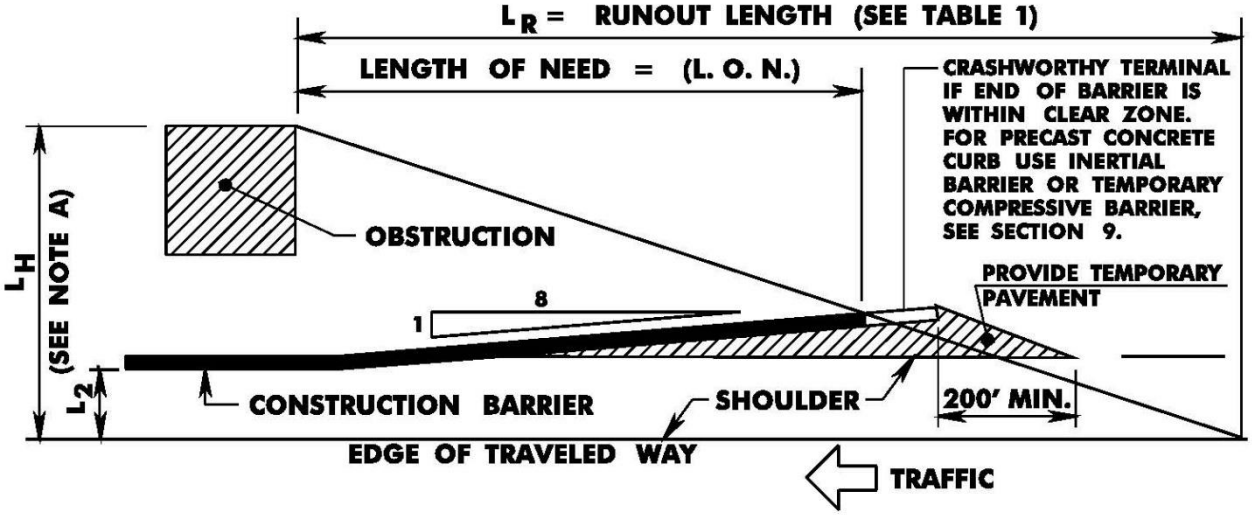

TABLE – 1

	TRAFFIC VOLUME (A.D.T.)			
	OVER 10,000	5,000–10,000	1,000–5,000	UNDER 1,000
DESIGN SPEED (M.P.H.)	L_R	L_R	L_R	L_R
70	360	330	290	250
60	300	250	210	200
55	265	220	185	175
50	230	190	160	150
45	195	160	135	125
40	160	130	110	100
30	110	90	80	70

NOTE A: If obstruction extends beyond Clear Zone, make L_H equal to Clear Zone, except if obstruction is a Critical Slope, see Figure 8–H.

NOTE B: If Roadway is curved, draw layout to scale and obtain L.O.N. directly by scaling from drawing.

NOTE C: If barrier end is parallel to Roadway (no flare), then change "1⁄8" in formula to "0".

NOTE D: When using Attachment Type B, the LON is the greater of 50′ long or the calculated taper length.

EXAMPLE

$$\text{L.O.N.} = \frac{L_H - L_2}{\frac{1}{8} + \frac{L_H}{L_R}}$$

L_2 = 15′
L_H = 25′
L_R = 360′
DESIGN SPEED = 70 mph
ADT = 26,000

$$\text{L.O.N.} = \frac{25 - 15}{\frac{1}{8} + \frac{25}{360}}$$

L.O.N. = 51.4′, increase to nearest multiple of 20′, therefore L.O.N. = 60′

SOURCE: AASHTO "ROADSIDE DESIGN GUIDE", 4TH EDITION 2011

REV. DATE: November 16, 2021

FIGURE 14–B:
TEMPORARY EMERGENCY PULL–OFF